CLAIMS

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. A process for removing metal from fluid, the process comprising:
   a) supplying a active metal sorbent; and
   b) contacting the fluid with the sorbent for a time sufficient for the metal to absorb to predetermined regions of the sorbent.

2. The process as recited in claim 1 wherein the contacting step further comprises:
   a) relegating metal adsorption to an exterior surface of the sorbent; and
   b) allowing the relegated metal to diffuse into the interior of the sorbent.

3. The process as recited in claim 2 wherein the metal diffuses into the sorbent when the sorbent is heated to more than 150°C (300°F).

4. The process as recited in claim 1 wherein the metal to be adsorbed is a Group IIB metal selected from the group comprising of mercury, cadmium or a combination thereof.

5. The process as recited in claim 1 wherein the temperature of the gas ranges from approximately ambient to 370°C (700°F).

6. The process as recited in claim 1 wherein the fluid is selected from the group consisting of fuel gases and combustion gases.

7. The process as recited in claim 1 wherein the metal sorbent consists of a metal selected from the group consisting of iridium, palladium, platinum, and ruthenium or a combination thereof.

8. The process as recited in claim 4 wherein the Group IIB (12) metal forms an amalgam with the metal in the sorbent.

9. The process as recited in claim 1 wherein the metal sorbent is a solid mass.

10. The process as recited in claim 9 wherein the active metal is dispersed throughout the solid mass.

11. The process as recited in claim 10 wherein the surface area of the solid mass is between approximately 1 m^2/gram to 1000 m^2/gram.

12. The process as recited in claim 1 wherein the metal sorbent is regenerated by heating to a temperature above 500°C (930°F).

13. The process as recited in claim 12 wherein the Group IIB (12) metal is desorbed from the sorbent.

14. A process for increasing the surface area of an active metal sorbent, the process comprising:
    a) supplying a support with a surface area of between 1 m^2/g to 1000 m^2/g; and
    b) depositing active metal on the support.

15. The process as recited in claim 14 wherein the support is a high temperature tolerant material selected from a group consisting of activated carbon, alumina, aluminosilicates, silica, titania, zirconia, zeolite, or combinations thereof.

16. The process as recited in claim 14 wherein the support can withstand temperatures above 925°C (1700°F).

17. The process as recited in claim 14 wherein the deposited metal sorbent is a solid phase selected from the group consisting of extrudates, powders, pellets, or monoliths.

18. A process of increasing the resistance of metal sorbents to chemical reaction, the process comprising alloying active metals.

19. The process as recited in claim 18 wherein the active metals are selected from the group consisting of iridium, platinum, palladium, and ruthenium.

20. The process as recited in claim 18 wherein the active metal is deposited on a support in a controlled atmosphere selected from the group consisting of argon (Ar), nitrogen (N_2), or a combination thereof.